

I Claim:

1. A stent for delivering drugs to a vessel in a body comprising:
a stent framework including a plurality of reservoirs formed therein,
the reservoirs formed using a femtosecond laser;
a drug polymer positioned in the reservoirs; and
a polymer layer positioned on the drug polymer.
2. The stent of claim 1 wherein the stent framework comprises one of
a metallic base or a polymeric base.
3. The stent of claim 2 wherein the stent framework base comprises a
material selected from the group consisting of stainless steel, nitinol, tantalum,
MP35N alloy, platinum, titanium, a suitable biocompatible alloy, a suitable
biocompatible polymer, and a combination thereof.
4. The stent of claim 1 wherein the reservoirs comprise micropores.
5. The stent of claim 4 wherein the micropores have a diameter of
about 20 microns or less.
6. The stent of claim 4 wherein the micropores have a diameter in the
range of about 20 microns to about 50 microns.

7. The stent of claim 4 wherein the micropores have a depth in the range of about 10 to about 50 microns.

8. The stent of claim 4 wherein the micropores have a depth of about 50 microns.

9. The stent of claim 4 wherein the micropores extend through the stent framework having an opening on an interior surface of the stent and an opening on an exterior surface of the stent.

10. The stent of claim 4 further comprising:
a cap layer disposed on the interior surface of the stent framework, the cap layer covering at least a portion of the through-holes and providing a barrier characteristic to control an elution rate of a drug in the drug polymer from the interior surface of the stent framework.

11. The stent of claim 1 wherein the reservoirs comprise channels along an exterior surface of the stent framework.

12. The stent of claim 1 wherein the drug polymer comprises a therapeutic compound.

13. The stent of claim 12 wherein the therapeutic compound is selected from the group consisting of an antisense agent, an antineoplastic agent, an antiproliferative agent, an antithrombogenic agent, an anticoagulant, an antiplatelet agent, an antibiotic, an anti-inflammatory agent, a therapeutic peptide, a gene therapy agent, a therapeutic substance, an organic drug, a pharmaceutical compound, a recombinant DNA product, a recombinant RNA product, a collagen, a collagenic derivative, a protein, a protein analog, a saccharide, a saccharide derivative, and a combination thereof.

14. The stent of claim 1 wherein the drug polymer comprises a first layer of a first drug polymer having a first pharmaceutical characteristic and the polymer layer comprises a second drug polymer having a second pharmaceutical characteristic.

15. The stent of claim 1 further comprising:
a barrier layer positioned between the drug polymer and the polymer layer.

16. The stent of claim 15 wherein the barrier layer comprises a polymer selected from the group consisting of a silicone-urethane copolymer, a polyurethane, a phenoxy, ethylene vinyl acetate, polycaprolactone, poly(lactide-co-glycolide), polylactide, polysulfone, elastin, fibrin, collagen, chondroitin sulfate, a biocompatible polymer, a biostable polymer, a biodegradable polymer, and a combination thereof.

17. The stent of claim 1 wherein the drug polymer comprises a first drug-polymer layer including an anti-proliferative drug, a second drug-polymer layer including an anti-inflammatory drug, and a third drug-polymer layer including an antisense drug, the anti-inflammatory drug and the anti-proliferative drug being eluted in a phased manner when the stent is deployed.

18. The stent of claim 1 wherein the polymer layer comprises a cap layer.

19. The stent of claim 18 wherein the cap layer is positioned on the drug polymer and at least a portion of an interior surface or an exterior surface of the stent framework.

20. The stent of claim 18 wherein the cap layer comprises a polymer selected from the group consisting of a silicone-urethane copolymer, a polyurethane, a phenoxy, ethylene vinyl acetate, polycaprolactone, poly(lactide-co-glycolide), polylactide, polysulfone, elastin, fibrin, collagen, chondroitin sulfate, a biocompatible polymer, a biostable polymer, a biodegradable polymer, and a combination thereof.

21. The stent of claim 1 further comprising:
an adhesion layer positioned between the stent framework and the drug polymer.

22. The stent of claim 21 wherein the adhesion layer is selected from the group consisting of a polyurethane, a phenoxy, poly(lactide-co-glycolide), polylactide, polysulfone, polycaprolactone, an adhesion promoter, and a combination thereof.

23. The stent of claim 1 further comprising:
a catheter coupled to the stent framework.

24. The stent of claim 23 wherein the catheter includes a balloon used to expand the stent.

25. The stent of claim 23 wherein the catheter includes a sheath that retracts to allow expansion of the stent.

26. A method of manufacturing a drug-polymer stent, comprising:
providing a stent framework;
cutting a plurality of reservoirs in the stent framework using a high power laser;
applying a drug polymer to at least one reservoir;
drying the drug polymer;
applying a polymer layer to the dried drug polymer; and
drying the polymer layer.

27. The method of claim 26 wherein the plurality of reservoirs are cut with a femtosecond laser.

28. The method of claim 26 wherein the drug polymer is applied using a technique selected from the group consisting of spraying, dipping, painting, brushing and dispensing.

29. The method of claim 26 wherein the drug polymer is applied to at least one reservoir using a mask.

30. The method of claim 26 wherein the polymer layer comprises one of a drug polymer, a barrier layer, or a cap layer.

31. The method of claim 26 wherein the polymer layer is applied using a technique selected from the group consisting of spraying, dipping, painting, brushing and dispensing.

32. The method of claim 26 wherein the polymer layer is applied to at least a portion of an interior surface or an exterior surface of the stent framework using a mask.

33. The method of claim 26 further comprising:
applying an adhesion layer to at least one reservoir prior to the application of the drug polymer.

34. A method of treating a vascular condition, comprising:
positioning a stent within a vessel of a body, the stent including a stent framework with a plurality of micropore reservoirs formed therein using a femtosecond laser, a drug polymer positioned in the reservoirs, and a polymer layer positioned on the drug polymer;
expanding the stent; and
eluting at least one drug from at least an exterior surface of the stent.